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AUTHOR Grannis, Joseph C.
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ABSTRACT

In the 1982-1983 school year, the Public Education Association, an educational advocacy organization in New York City, undertook an action research project on young adolescents' stress in school. The project was located in one inner-city intermediate school for 4 years and is now following graduates of that school in the city's high schools. As part of this project, 90 students completed a project instrument to measure school stress in the fall of the eighth grade. Fifty-three of these students had completed an earlier version of the instrument in the sixth grade and 72 had completed it in the seventh grade. Results revealed that stress variables were more crucial to the boys' grades than to the girls' grades for this sample of black inner-city youth. Girls appraised stressor events as more upsetting than did boys, and this was associated with girls' higher grades. Other results suggest that locus of control, stressor appraisal, and stressor frequency may all be derivative of students' being more or less able in mathematics. A reduction in level of stress perceived by students between the sixth and seventh grades may be attributed to the students' acclimatization to junior high school and/or to the project intervention. (Sixteen data tables are included.) (NB)

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Young adolescents' stress in school, self-reported distress, and academic achievement: A longitudinal study in an urban middle school

Joseph C. Grannis

Teachers College, Columbia University

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Young adolescents' stress in school, self-reported distress, and academic achievement: A longitudinal study in an urban middle school

Joseph C. Brannis
Teachers College, Columbia University

The stress of students in school has only recently begun to draw as much attention in research as the stress of teachers and administrators. In 1982-83 the Public Education Association, an educational advocacy organization in New York City, undertook an action research project on young adolescents' stress in school. The project was located in one inner-city intermediate school for four years, and is now following graduates of that school in the city's high schools. The work has been funded throughout by the William T. Grant Foundation.

The purpose of our research has been to discover and ameliorate the sources of students' stress in school. Hearing school staff attribute students' difficulties to problems at home, we rather willfully concentrated on stressor events at school. Over time, we have come to be familiar with some of the students' home situations, but our study has not been designed to focus on them. In addition to obtaining the various objective measures that will be reported in this paper, we have engaged in extensive individual and group counseling, tutoring, and school-level intervention, much of which has lent itself to participatory observation. The quantitative and qualitative aspects of our work have complemented each other.

Longitudinal sample

With the focus of today's session on the longitudinal study of students' stress, I am going to concentrate on students in one grade-level cohort, for some of whom we obtained various measures in three consecutive years. The sample is 90 students who completed a project instrument to measure school stress in the fall term of the eighth grade, 53 of whom had completed an earlier version of the instrument in the sixth grade, and 72 of whom had completed it in the seventh grade. The number of students in the cohort increased from year to year

because new students entered the school in the seventh grade and because, in addition, more parents gave permission for their children to participate in the project in each successive year. Our sample for these longitudinal analyses is very small, but the findings are provocative nonetheless. The school was a public intermediate school in an urban black community. About a third of the students were over-age because they had been held back in school for a year or more in elementary school. All of the students were black and most came from low-income families.

Let me reiterate the point about the small sample with a different emphasis. Much of what this project is finding is specific to its sample and its situation and should not be generalized to other populations and contexts. Nonetheless, the findings have internal coherence, and there is consistency with what is known about the more familiar variables in other contexts. There is a lot to be learned from the intensive study of a small sample.

School stress instrument

Several instruments have been developed to measure a variety of teacher stressors, including unsupportive administrators, classroom crowding, inadequate supplies, etc. (Pettegrew & Wolf, 1982). However, instruments for students have assayed a relatively narrow range of stressors in school: mostly events that evoke performance anxiety in school (Phillips, 1978; Sarason, 1980), or academic failures included in recent life events (Coddington, 1972; Yeaworth, 1980). For several years the author and his co-researchers have been developing an instrument to measure students' experience of a broad range of physical, social, and academic stressors in school. Things that Happen in School (THIS) also measures students' experience of social support in school, but I will not be reporting social support findings in this paper.

Our current version of THIS presents students with twenty stressor events and twenty support events, in random order, and asks them to make two judgments about each event: how they would react to the event <u>if</u> it happened (from feel very good to feel very upset), and how often it <u>did</u> happen during the past week (from almost never to often). The first, reaction response now appears to us to be very closely related to what

Lazarus has called "appraisal," a "process through which the person evaluates whether a particular encounter with the environment is relevant to his or her well-being" (Folkman, Lazarus, Dunkel-Schetter, Deloggis, & Gruen, 1986: 992). We have hypothesized that students' appraisal of stressor events in school moderates the impact of the events on their achievement and their psychological well being. This hypothesis has been very difficult to work out empirically.

For 159 students who completed THIS in Fall 1983, including the 53 cohort students who were then in the sixth grade, the Cronbach alphas (Cronbach, 1970) were .85 for Stressor Appraisal and .85 for Stressor Frequency. For 166 students who completed the revised THIS in Fall 1985, including the 90 students in the cohort sample at this time, the alphas were .87 for Stressor Appraisal and .79 for Stressor Frequency. For all of the analyses to be reported in this paper, a subset of THIS items that remained unchanged between 1983 and 1985 has been used. These are the appraisal and frequency questions addressed to the following sixteen stressor events, given here in the order in which they occur in the instrument:

- There was a lot of cursing in class.
- Someone tried to copy my work when I didn't want them to.
- Someone hit me, or kicked or pushed me.
- I couldn't get an answer to a question I asked.
- People in the hall were bothering the classroom.
- Someone made fun of something I said in class.
- People in the classroom wouldn't get quiet.
- I or one of my friends was moved to a different class.
- Someone shouted or screamed at me.
- Someone tried to pressure me to cut class.
- I felt unsafe in the school.

- I could not finish my work in class.
- Somebody treated me like I always do wrong.
- I didn't have a pen or paper or my book to do my work in class.
- Someone was picking on me in the hall.
- There was a change of teachers in one (or more) of my classes.

Consistency of Stressor Appraisal and Stressor Frequency over time

The first question we shall address is how consistently the students perceived the stressor events over the three years between sixth and eighth grade.

Table 1 shows that the level of Stressor Appraisal dropped from 3.84 to 3.47 for the boys between sixth and seventh grades, while for the girls it dropped from 4.04 only to 3.92. In other words, the average appraisal for the boys was shifting from near "upset" toward "makes no difference", while for the girls it stayed close to "upset".

Both the boys and the girls perceived the stressor events to be happening somewhat less frequently on the average in the seventh and eighth grades than in the sixth grade. The average frequency shifted from close to "sometimes" (1.86) part way toward "almost never" (1.64) for the boys and girls combined.

It will be recognized that the figures in Table 1 pool students who entered the cohort in sixth grade with students who entered it in seventh grade, to obtain the seventh grade means. When the analysis is conducted for just the students who entered in the sixth grade, the patterns are the same. For 30 boys, the drop in Stressor Appraisal from 3.82 to 3.47 was highly significant ($t=3.16$, $p<.01$), as was the decrease in Stressor Frequency from 1.81 to 1.56 ($t=4.66$, $p<.001$). For 19 girls, Stressor Appraisal stayed the same, 4.02 in sixth grade vs. 4.04 in seventh, but Stressor Frequency declined from 1.87 to 1.60 ($t=3.78$, $p<.001$). (Figures not shown in Table 1.)

From Table 2 it appears that there was only a low

correlation between Stressor Appraisal in the sixth and in the seventh grade (r=.26, p<.05), and even less between the sixth grade and the eighth, but that the correlation between seventh and eighth grade was substantial (r=.56. p<.001). Tables 3 and 4 show that the pattern was actually quite different for boys and for girls. For girls, there was as high a correlation between sixth and eighth grade Stressor Appraisal (r=.51, p<.05) as between seventh and eighth grade (r=.52, p<.001). For the boys, Stressor Appraisal in seventh and eighth grade correlated .42 (p<.01), but between sixth grade and eighth it correlated -.15 (n.s.).

For both the boys and the girls, the intercorrelations were higher for frequency than for appraisal. For the total sample, Stressor Frequency correlated .61 (p<.001) between the sixth and the seventh grade, and .61 (p<.001) between the seventh grade and the eighth (Table 2).

Stressor Appraisal and Stressor Frequency were essentially uncorrelated, though there was some tendency for the boys who said they got more upset by stressor events in the sixth grade to report these events happening more frequently in the sixth grade and again in the eighth grade.

In constructing Things that Happen in School, we expected there to be more consistency in the students' reactions to stressor events from one year to another than in the frequencies that the students reported. The project did work to reduce the overall frequency of stressors experienced by the students, but it was anticipated that the changes would vary greatly from one individual to another, as a function of the different school and classroom contexts in which stressor events occurred. The high intercorrelations for Stressor Frequency indicated otherwise. This then underscores the question of what other measures correlated with Stressor Appraisal and Stressor Frequency.

Selected measures for intercorrelation

Table 5 lists ten measures in the order in which the project obtained them, between Fall 1983 and early 1986, that is, between the first semester of the sixth grade and midyear in the eighth grade for the cohort in

this sample. Four of the measures have already been introduced, Stressor Appraisal as measured in the fall semesters of the seventh and eighth grades (STRAP7 and STRAP8) and Stressor Frequency as measured in the fall semesters of the seventh and eighth grades (STRFR7 and STRFR8). The Nowicki-Strickland Children's Locus of Control Scale was administered in the fall of the sixth grade (NSLC6) and in the spring of the seventh grade (NSLC7). An average reading test score was calculated from spring sixth grade and spring seventh grade administrations of the California Achievement Test in Reading (READ67), and an average mathematics test score was calculated from spring sixth grade and spring seventh grade adminstrations of a Citiwide Mathematics Test (MATH67). A Distress score was obtained in the fall of the eighth grade using an adaptation of Langner's 22-item Screening Device (DIST8). Finally, Midyear Grade Point Average for the first semester of the eighth grade was calculated (MGPA8). The project obtained other measures at various points, but these are as many as we want to present at one time.

The Nowicki-Strickland Children's Scale of Internal-External Control (Nowicki & Strickland, 1973) was designed for use with black children and youth. Scores range from 0 to 40, with higher scores denoting externality. Test-retest reliability has been reported to be .66 for 7th grade children (Nowicki & Strickland, 1973). Only four of the 40 items on the instrument relate directly to academic events, most of the items pertaining to physical and social events. Nevertheless, it has been found in previous research that internality correlated with higher academic achievement for children from grades 3 through 12 (Nowicki & Strickland, 1973). Individuals with a more external locus of control have been found to be more at risk of low grades and of high anxiety (Bethea, 1987).

Our composite California Achievement Test in Reading Score (READ67) takes the average of the scores if both are available, or one score if only one is available. The sixth grade score has been adjusted so that the average is calculated relative to seventh grade norms. The boys' reading scores in seventh grade appeared to be systematically inflated by an irregularity in the school's administration of the test, and this is corrected somewhat by the averaging, in addition to the procedure's increasing the number of students for whom there are test scores. The same procedure increases the number of students for whom there are Citiwide Mathematics Test scores (MATH67).

Grannis and Fahs slightly reworded 15 items from the Langner (1962) 22-Item Screening Device, which has been widely used as a general measure of psychological health. A four choice response, from "not at all" to "quite a lot", was substituted for a two choice "yes" and "no" response to a question about how often the specified feelings or complaints had happened during the past two weeks. A factor analysis we performed on the resulting Distress Scale (called "Self-Report") found three factors: psychological symptoms or depression, psychosomatic symptoms, and illness symptoms.

A grade point average was calculated from the students' grades in four major subjects, Language Arts, Mathematics, Science, and Social Studies, at the end of the first semester of the eighth grade. Subjects in which a student did not receive a numerical grade because of excessive absence were assigned a grade of 55 (though only if the student was still active in the school). Grades at midyear appeared to be more closely related to classroom performance than grades at the end of the year, when there was a strong press to graduate the students.

It can be seen from Table 5 that the mean scores of the boys and the girls respectively were significantly different only for two variables: Stressor Appraisal, at both times reported, and Grade Point Average, midyear in the eighth grade. This is consistent with the projects' findings throughout. Boys and girls have always scored significantly differently on Stressor Appraisal and Grade Point Average, and only on these measures. It does suggest that the higher grades of the girls are linked to their appraising the stressor events more strongly. This occurs despite the fact that the sixteen stressor events that are included in these analyses deliberately omit two events from THIS that explicitly refer to academic failures as stressors. More generally, it is important to notice that the students' grades, especially the boys', are lower than the standardized reading and math test scores would lead one to expect. The students tested close to the expected score (8.0 actual vs 7.7 expected) in reading for seventh grade second semester, and about half a year behind the expected score (7.1 vs 7.7) in mathematics at this time. Even allowing that the students' were half a year over-age for their grade, on the average, one still wants to know what else is contributing to the students' low grade point

averages in this school.

Both the boys' and the girls' Nowicki-Strickland externality scores changed significantly between the fall of the sixth grade and the spring of the seventh grade, in line with findings that have been reported for other students between elementary school and junior high school.

Correlation of THIS subscales with other measures over time

Table 6 reports the correlations among the selected variables for the total sample, while Tables 7 and 8 report the correlations for the boys and the girls separately.

For the girls, there was no significant relationship between Stressor Appraisal and Nowicki-Strickland externality at any points in time, and for the boys there was a significant relationship only between Stressor Appraisal for Fall 1984 and Nowicki-Strickland for Fall 1983 ($r=-.49$, $p<.01$). Stressor Appraisal seems to have been largely independent of locus of control.

For the girls, Nowicki-Strickland externality and Stressor Frequency reached some level of significance in three of the four correlations between the measures at different points in time, the strongest being NSLCS7 with STRFR8 ($r=.65$, $p<.001$). For the boys, the seventh grade externality score correlated significantly with Stressor Frequency, the strongest correlation again obtaining between NSLC7 and STRFR8 ($r=.38$, $p<.01$). However, the sixth grade externality score did not correlate with Stressor Frequency for the boys. Analyzing for the total group, it appears that Stressor Frequency in both the seventh and the eighth grade was highly related to locus of control as measured in the seventh grade, but was not related to locus as measured in the sixth. Eighth grade Distress was slightly related to locus as measured in the seventh grade ($r=.20$, $p<.05$), but was not related to locus in the sixth.

Stressor Appraisal did not correlate significantly with Distress for the total group in either year that appraisal was measured, though for seventh grade appraisal there was a significant negative correlation

for the boys.

For both the girls and the boys, Stressor Frequency in the seventh grade and again in the eighth grade correlated positively with Distress in the eighth grade. For the two groups combined, the correlation with eighth grade Distress was .41 ($p<.001$) for Stressor Frequency in the seventh grade and .43 ($p<.001$) for Stressor Frequency in the eighth.

When the data are analyzed for boys and girls together, the only significant relationship between Stressor Appraisal in either seventh or eighth grade and the composite reading or mathematics test scores is between Stressor Appraisal in eighth grade and the mathematics score ($r=.19$, $p<.05$). Stressor Appraisal in the seventh grade and again in the eighth both have a low but significant positive relationship to Grade Point Average at midyear in the eighth grade ($r=.29$, $p<.01$, and $r=.26$, $p<.01$, respectively).

These relationships are quite different for boys and girls separately. For the girls, there are no correlations that even approach significance between Stressor Appraisal and test score or grade point average between any points in time. For the boys, Stressor Appraisal in both the seventh and the eighth grade correlated significantly with reading test score composite in Spring 1985, mathematics test score composite in Spring 1985, and Grade Point Average at midyear 1985-86. The correlation of STRAF7 with MGPA8 was .28 ($p<.05$), and of STRAF8 with MGPA8 was .25 ($p<.05$). The boys who were higher achievers, then, consistently had some tendency, albeit statistically weak, to appraise stressor events in school as more upsetting--or vice versa.

For the girls, reading test was negatively correlated with Stressor Frequency in the seventh grade ($r=-.47$, $p<.01$) and the eighth ($r=-.28$, $p<.05$); mathematics test was negatively correlated with Stressor Frequency in the seventh grade ($r=-.39$, $p<.05$) and the eighth ($r=-.34$, $p<.05$); but eighth grade Grade Point Average was not significantly correlated with Stressor Frequency. For the boys, reading was not related to Stressor Frequency in either year, but mathematics test had some relationship both in seventh grade ($r=-.23$, $p<.10$) and in eighth ($r=-.21$, $p<.10$). For the boys, eighth grade Grade Point Average was significantly related to Stressor Frequency in the eighth grade ($r=-.26$, $p<.05$).

Analyzing for the total group, sixth grade Nowicki-Strickland externality correlated more strongly with reading (for the total sample, $r=-.38$, $p<.01$) than with mathematics ($r=-.24$, $p<.10$) while seventh grade externality correlated more strongly with mathematics ($r=-.34$, $p<.01$) than with reading ($r=-.24$, $p<.05$). Overall, locus of control appeared to have been consistently related to the students' test performances.

For the boys, locus of control in both the sixth and the seventh grade was significantly related to eighth grade midyear grade point average, and for the girls seventh grade locus was significantly related to grade point average. Looking at the relationships for the total group, sixth grade locus correlated with eighth grade midyear grade point average -.28 ($p<.05$) and seventh grade locus correlated -.33 ($p<.01$).

For both the girls and the boys, while reading correlated significantly with grade point average (for the total sample, $r=.37$, $p<.001$), mathematics correlated much more strongly ($r=.65$, $p<.001$). Reading test scores are generally emphasized more than mathematics test scores in research and the public press alike, so this finding, consistent with others in the project, is quite arresting. For both the girls and the boys, mathematics correlated more strongly than reading with Stressor Frequency in both seventh grade ($r=-.31$, $p<.01$) and eighth grade ($r=-.27$, $p<.01$). One observes that mathematics is a more school-dependent subject than reading. The learning of mathematics may thus be interrupted more by the occurrence of school stressors, as, equally, lower skill in mathematics may make a student more likely to experience stressors in school.

General patterns

The analysis so far has indicated some overall patterns in the students' perceptions and performances. (1) Boys appraised stressor events as significantly less upsetting in seventh grade than in sixth grade, and both boys and girls perceived the events happening less often in the seventh grade than in the sixth. Locus of control became less external between the sixth and the seventh grade, for both boys and girls. (2) The strength of an individual's

tendency to appraise stressor events, and the frequency that he or she typically ascribed to the events, functioned quite differently from each other. (This is different from saying that there was no relationship between the students' average appraisal of a given event and the frequency of it. In fact, some events that were reported least were reacted to the most strongly, for example being hit, while some that were reported most often evoked the weakest reactions, for example a noisy classroom.) (3) The appraisal of stressor events was not consistently related to distress for either boys or girls, but stressor frequency was positively associated with distress for both. (4) Girls consistently appraised stressor events more strongly than did boys. For the total group, stressor appraisal was associated positively with grade point average, but not with test performance. In the separate analyses by gender, appraisal correlated significantly with both tests and grades for the boys, but with neither for the girls. (5) The associations of stressor frequency with academic performance were consistently negative. (6) External locus of control had some tendency to amplify the frequency of stressor events, and had some association with distress. (7) For both boys and girls, externality tended to correlate negatively with academic performance.

Locus of control as a moderator of the impact of Stressor Frequency on Distress

One of the questions we have pursued at a deeper level of analysis asks what effect locus of control has on the relationship between the perceived frequency of stressor events and students' self-reported distress symptoms. Figure 1 plots the regression lines obtained from scattergrams for the students whose Nowicki-Strickland externality score was less than or equal to 14 (n=40), and those whose externality score was greater than 14 (n=34). For the students with lower externality, the correlation between Stressor Frequency in eighth grade and Distress was .11 (n.s.). For those with higher externality, the correlation was .63 ($p<.001$). The external students were less likely than the internals to experience distress at low levels of stressor frequency, and more likely to experience it when stressor frequency was high.

Prediction of eighth grade midyear grade point average from THIS subscales and locus of control, after controlling for reading or mathematics

A factor analysis of THIS scores for all 166 students who completed the instrument at the time that the cohort students were in the eighth grade produced meaningful factors that have subsequently been used to define shorter Stressor Appraisal and Stressor Frequency subscales. These subscales have in turn been drawn on to create predictor scales. All of the items in the predictor scales referred to below are based on the 16 events that are listed above as common to THIS in its original and its revised versions. For Stressor Appraisal, 10 items derived from factors called "assaults on safety and integrity" and "disruption of classwork" form the predictor variable (STRABPR). For Stressor Frequency, 8 items derived from factors called "physical and material assaults" and "academic trouble" form the predictor variable (STRFBPR). Finally, a term for the interaction between Stressor Frequency and Nowicki-Strickland has been created with NSLC7 and STRFBPR (STFBLCX). Table 9 reports the means, standard deviations, and correlations of these variables for the 74 students for whom eighth grade THIS scores, NSLC7, MGPA8, and READ67 were all available. Table 10 reports these statistics for an almost identical set of 73 students for whom MATH67 was available.

The new variables have been entered into regression equations to predict eighth grade midyear grade point average. READ67 OR MATH67 has been entered first, followed by NSLC7, STRABPR, STRFBPR, and STFBLCX. The order of the variables insures that variance that might be explained by test score or locus of control is not attributed to a stressor subscale, and that the interaction variance is calculated last. Tables 11, 12, and 13 report the results of the regression analysis with reading for the total cohort and the boys and the girls separately. Tables 14, 15, and 16 report the results with mathematics for the total cohort.

From Table 11, it appears that locus of control explains 6.0% of the variance in grade point average after reading has been removed ($p<.05$), and that Stressor Appraisal then accounts for another 7.9% ($p<.01$) and Stressor Frequency yet another 5.0% ($p<.05$). The betas for these are all in the expected direction, with externality and stressor frequency contributing negatively to grade point average, and stressor appraisal contributing positively. The interaction term is significant at the .05 level, but the interaction is explained by outlier cases.

Table 12 shows that for the boys the variance

attributed to reading is reduced from the 13.2% that resulted for the whole sample to 8.6%. Externality accounts for another 5.7% of variance, but does not attain significance. Stressor Appraisal accounts for only 4.6% of variance, but Stressor Frequency explains 11.5% ($p<.05$). From Table 13 it can be seen that for the girls reading is a much stronger predictor, explaining 39.6% of variance ($p<.001$), and only externality accounts for any significant variance after reading, (5.6%, $p<.10$).

Table 14 reveals that mathematics test score explains 45.8% of the variance for the students in this sample, totally eclipsing locus of control, and reducing the variance attributable to the stressor variables to miniscule amounts. This is readily evident from a comparison of the beta weights with the original correlations of the several variables with grade point average. For the boys separately (Table 15), mathematics explains 44.5% of variance, while for the girls (Table 16) it accounts for 60.8%. Only Stressor Frequency explains any additional variance for the boys (5.1%, $p<.10$), and no variable explains additional variance for the girls.

Individual cases

The general trends and processes that the statistics indicate abstractly provide a framework in which to interpret individual cases and specific events. The configurations of variables will be more unique in individual cases. Consider, for example, three children who entered the project in the sixth grade, Janice, David, and Charles. (The names to be used here are fictitious.) All three had relatively external scores on the Nowicki-Strickland in the sixth grade. All three, but particularly Charles, reported a higher frequency of stressor events in the sixth grade than the average for the cohort at that time.

Throughout grades six to eight, it was often evident from the expressions on Janice's face and the tone of her voice that she was reacting strongly to events in class. In an interview designed by my colleague in this session, Mary Ellen Fahs (Fahs, 1987), Janice identified a variety of things that upset her in the school, using the expression, "It really gets me mad!" Janice's very high Stressor Appraisal scores in all three grades--4.50 in grade six, 4.06 in grade seven,

and 4.31 in grade eight--were consistent with these responses. Janice was teased a lot for her size, but she performed a solo dance very gracefully in an eighth grade show and was applauded by her peers. The frequency of stressor events increased for Janice in seventh grade, and then decreased to its lowest level in eighth grade, though it was still higher than the class average in eighth grade. The level of distress she reported at this time was average for the grade. Janice regulated her involvement in disruptive classroom events very carefully. On many occasions, she watched what was happening without participating verbally, though if the students in a class were generally disregarding a teacher and interacting with each other, Janice did so too. Janice rarely challenged teachers directly, but on one occasion when a teacher she did not respect had accused her of something she said she was not doing, she "told him off to his face." Janice's locus of control score remained relatively external, 17, in the seventh grade. Her reading test average was more than a year below grade level, while her math test average was slightly above grade level. Janice's midyear grade point average of 75.0 was average for the girls. Her average at midyear in sixth grade had been 80.0 and in seventh grade it was 78.8. Especially in view of her externality, one surmises that her strong appraisal of stressor events was an important factor in her survival in this school. Janice got into the high school of her choice this year, and has been "loving" it, passing all but one of her courses in the first semester of ninth grade.

David related in the Fahs interview that what upset him most in school was people picking on him "cause I'm small." He said on that occasion that he walks away and hopes people won't bother him. In one observation, a bigger boy was chasing David and he hid behind a screen, manifestly hoping that the boy would give up, though the boy in chase clearly knew where David was. He was rather excitable in class. David's Stressor Appraisal score was about average for the boys in sixth and eighth grade, 3.75 and 3.50 respectively, but had dropped to 3.31 in the seventh grade. Stressor Frequency for David was higher than the class average in all three grades, and his Distress score, 32, was higher than the class average of 29. David interacted a lot with several other small boys in class, one of them Charles. They often drew cartoons together and read each other's original comic books. The group seemed to be a refuge from the larger boys. Teachers frequently

reprimanded David for talking, but David seemed to be aware of when he needed to pay attention. One time when he was drawing with another boy, the teacher wrote a new word on the board and pronounced it, "quadrilateral." David, in sequence, pointed to his friend and the word, put his finger on his lips, got out his notebook and wrote the word down, and then returned to his drawing. David talked back to teachers from time to time, and once passionately defended a classmate from the teacher's accusation that he smelled, saying maybe it was the teacher herself that smelled so bad. David's reading score was on level for his grade, while his math score was a year and a half below level. David's locus of control score shifted from 18 to 12 between sixth and seventh grade. His eighth grade midyear grade point average was 74.0, above average for the boys. In the sixth grade his midyear average had been 82.3, and in the seventh grade it had fallen to 66.3. He was admitted to a general high school, rather than the special art school that he wanted. It is a very difficult environment, and he has passed only half of his courses during the first semester. In view of his low math test scores, David's shift to internality seems to have been crucial to his survival in intermediate school, perhaps coupled with his average (rather than below average appraisal of stressor events.

Charles, in the Fahs interview, also cited other students' picking on him as particularly upsetting. When he was asked what he then said to himself, he replied, "I shouldn't have gotten myself into this situation." This was a characteristic response for Charles, who regularly talked about what he should do as a solution to problems he was having. It might sound internal, but his behavior was more external. Charles was responsive to adults when they made demands on him in school, and responsive to his friends, the person that was closer or more assertive being the one that Charles was likely to be most influenced by. Charles avoided conflict with his teachers. In the seventh grade, he started to grow bigger than his friends, though still not as big as the larger boys in class, and he began to withdraw from classes and hang out sometimes in the hallway. His Stressor Appraisal score dropped from 4.13 in sixth grade, which was high for his grade, to 3.25 in seventh grade and then to 3.00 in eighth. Stressor Frequency for Charles was very high both in the sixth and the seventh grades, and then dropped to the same level as Janice and David in eighth grade, which was still higher than the class

average. Charles's distress score was average for the class. His reading test score average was the highest of the three children discussed here, 8.6, while his math test score, 6.6, was a year below grade level, lower than Janice's but higher than David's. Charles's eighth grade midyear grade point average was 60.0, reflecting two courses he barely passed and two he failed for cutting classes. His midyear average in sixth grade had been 75.7, and in seventh grade it had fallen to 66.3. Charles did not get into the special art school he wanted to attend along with David, and in a very destructive high school he has failed all of his courses this fall. Charles told an interviewer this fall that when he sets out to school, he has in mind that he is going to go to his classes and learn, but that as soon as he enters the door, he "becomes a different person." The school is large, there are crowds of kids in the halls on the way to his classes, no one student who is his friend is in more than one of his classes, and so forth. His responding on his eighth grade THIS that the stressor events "make no difference" seems to represent denial, withdrawal, and defeat all at once. In combination with his externality, Charles is very unprotected in the secondary school environment.

Discussion

Our discussion will begin with the last quantitative findings and move backward. The regression analysis controlling on reading has produced results that partly overlap with the results from an analysis I reported two years ago at AERA, from a sample of students that included both the sixth graders from the present cohort and students from the then seventh grade (Grannis, 1985). At that time, as now, much more of the girls' GPA variance was explainable from reading test performance than the boys'. However, stressor appraisal then was more prominent than stressor frequency in accounting for further variance in the boys' GPA's, whereas now the findings are opposite to this. What remains the same is that the stress variables were more crucial to the boys' grades than to the girls'. We can observe again that the role expectations for boys put them at greater risk than girls in the school classroom, and that locus of control and stressor appraisal might have played a part in how successfully boys negotiated conflicts between peer and teacher expectations. But this line of thinking also needs to include the finding, then and now, that the girls appraised stressor events as more

upsetting, and that this was associated with their higher grades, though appraisal did not differentiate the girls when they were analyzed separately. Locus of control, which did differentiate girls' as well as boys' achievement, may also be a component of appraisal, specifically the "secondary appraisal" that assesses what resources an individual has for dealing with a stressor event (Folkman et al. 1986).

The findings controlling on mathematics, however, throw all of this reasoning into doubt. Perhaps locus of control, stressor appraisal, and stressor frequency are all derivative of students' being more or less able in math. We have another set of findings not reported in this paper that show the self-esteem of the students in this cohort to be particularly correlated with mathematics test score. Perhaps instead of trying to enhance the students' awareness of the consequences of stressor events, and of ways of dealing with them, as we did in the years that we worked with these students, the project should have concentrated on improving their mathematics skills. Until we have evidence to disprove this possibility, I advance it seriously.

The reduction in the level of stress the students perceived between the sixth and the seventh grades might be attributed as much to their acclimatization to intermediate school (read "junior high school") as to the intervention of our project. That the project did not succeed in reducing the general level of stressor frequency in the school became evident to us from every angle of observation. Stress was ever renewing in the school, especially flowing from a chaotic school administration. Classes were reorganized a half a dozen times between September and December each year, throwing students and teachers into constantly changing relationships to each other, and destabilizing the efforts of both to pursue instruction. There was remarkably little time for learning in most of the classrooms most of the time. But this takes us to yet another level of the argument, for this means that there was precious little time for the direct application of mathematics skills.

Perhaps the attitudes which enter into locus of control and stressor appraisal influenced prior school learning, and thus particularly mathematics learning, for the students in this study. Thus it would be mathematics that became a proxy for these attitudes, rather than vice versa as speculated above. This is an important question to resolve in further longitudinal

research with a larger and more diverse sample of students. This applies as well to another conundrum that our research presents, the question of how much the frequency of stressors lies in the eye of the beholder, how much it is a function of the incestuous relationships among self-reported variables vs. a more objective phenomenon. Meanwhile, these problems should not obscure a simpler and more profound implication of our findings to date. This is that the students themselves consistently make the subtle distinctions that our measures depend upon--between being in control themselves or some other agent being in control, between getting upset about something vs. just reporting whether or not it happened, and between different events to be upset about. The very consistency of their responses to our instruments demonstrates their intelligence anew, and makes it the more urgent that we learn how to use these responses to improve their education.

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Table 1

Stressor Appraisal and Stressor Frequency
Means and Standard Deviations for Cohort Students
in Sixth, Seventh, and Eighth Grades

All

Variable	Cases	Mean	Std dev
STRAP6	53	3.9198	0.4360
STRAP7	72	3.6615	0.4677
STRAP8	90	3.6653	0.3994
STRFR6	53	1.8550	0.3488
STRFR7	72	1.6406	0.3432
STRFR8	90	1.6521	0.3173

Males

Variable	Cases	Mean	Std dev
STRAP6	33	3.8447	0.4561
STRAP7	41	3.4665	0.4072
STRAP8	53	3.5377	0.3664
STRFR6	33	1.8409	0.3487
STRFR7	41	1.6143	0.3196
STRFR8	53	1.6781	0.3159

Females

Variable	Cases	Mean	Std dev
STRAP6	20	4.0438	0.3794
STRAP7	31	3.9194	0.4193
STRAP8	37	3.8480	0.3772
STRFR6	20	1.8781	0.3567
STRFR7	31	1.6754	0.3748
STRFR8	37	1.6149	0.3199

Table 2

Stressor Appraisal and Stressor Frequency Correlations for Cohort Students in Sixth, Seventh, and Eighth Grades

All

	STRAP6	STRAP7	STRAP8	STRFR6	STRFR7	STRFR8
STRAP6	1.0000 (53) P=******	0.2611 (49) P= .035	0.1963 (53) P= .079	0.1433 (53) P= .153	0.0868 (50) P= .274	0.1642 (53) P= .120
STRAP7	0.2611 (49) P= .035	1.0000 (72) P=******	0.5617 (72) P=0.000	-0.0392 (49) P= .394	-0.1082 (71) P= .185	-0.1209 (72) P= .156
STRAP8	0.1963 (53) P= .079	0.5617 (72) P=0.000	1.0000 (90) P=******	0.0870 (53) P= .268	-0.1269 (72) P= .144	-0.1812 (90) P= .044
STRFR6	0.1433 (53) P= .153	-0.0392 (49) P= .394	0.0870 (53) P= .268	1.0000 (53) P=******	0.6123 (50) P=0.000	0.5414 (53) P=0.000
STRFR7	0.0868 (50) P= .274	-0.1082 (71) P= .185	-0.1269 (72) P= .144	0.6123 (50) P=0.000	1.0000 (72) P=******	0.6094 (72) P=0.000
STRFR8	0.1642 (53) P= .120	-0.1209 (72) P= .156	-0.1812 (90) P= .044	0.5414 (53) P=0.000	0.6094 (72) P=0.000	1.0000 (90) P=******

Table 3

Stressor Appraisal and Stressor Frequency Correlations for Male Cohort Students in Sixth, Seventh, and Eighth Grades

	STRAP6	STRAP7	STRAP8	STRFR6	STRFR7	STRFR8
STRAP6	1.0000 (33) P=******	0.0670 (30) P= .362	-0.1529 (33) P= .198	0.3164 (33) P= .036	0.1590 (31) P= .196	0.3136 (33) P= .038
STRAP7	0.0670 (30) P= .362	1.0000 (41) P=******	0.4168 (41) P= .003	-0.1724 (30) P= .181	-0.2852 (40) P= .037	-0.1165 (41) P= .234
STRAP8	-0.1529 (33) P= .198	0.4168 (41) P= .003	1.0000 (53) P=******	-0.0965 (33) P= .297	-0.2160 (41) P= .087	-0.1422 (53) P= .155
STRFR6	0.3164 (33) P= .036	-0.1724 (30) P= .181	-0.0965 (33) P= .297	1.0000 (33) P=******	0.5833 (31) P=0.000	0.6619 (33) P=0.000
STRFR7	0.1590 (31) P= .196	-0.2852 (40) P= .037	-0.2160 (41) P= .087	0.5833 (31) P=0.000	1.0000 (41) P=******	0.5724 (41) P=0.000
STRFR8	0.3136 (33) P= .038	-0.1165 (41) P= .234	-0.1422 (53) P= .155	0.6619 (33) P=0.000	0.5724 (41) P=0.000	1.0000 (53) P=******

Table 4

Stressor Appraisal and Stressor Frequency Correlations for Female Cohort Students in Sixth, Seventh, and Eighth Grades

	STRAP6	STRAP7	STRAP8	STRFR6	STRFR7	STRFR8
STRAP6	1.0000 (20) P=******	0.3863 (19) P= .051	0.5074 (20) P= .011	-0.2213 (20) P= .174	-0.0436 (19) P= .430	0.0188 (20) P= .469
STRAP7	0.3863 (19) P= .051	1.0000 (31) P=******	0.5236 (31) P= .001	0.0035 (19) P= .494	-0.0570 (31) P= .380	-0.0470 (31) P= .401
STRAP8	0.5074 (20) P= .011	0.5236 (31) P= .001	1.0000 (37) P=******	0.2901 (20) P= .107	-0.1243 (31) P= .253	-0.1750 (37) P= .150
STRFR6	-0.2213 (20) P= .174	0.0035 (19) P= .494	0.2901 (20) P= .107	1.0000 (20) P=******	0.6491 (19) P= .001	0.3949 (20) P= .042
STRFR7	-0.0436 (19) P= .430	-0.0570 (31) P= .380	-0.1243 (31) P= .253	0.6491 (19) P= .001	1.0000 (31) P=******	0.6725 (31) P=0.000
STRFR8	0.0188 (20) P= .469	-0.0470 (31) P= .401	-0.1750 (37) P= .150	0.3949 (20) P= .042	0.6725 (31) P=0.000	1.0000 (37) P=******

Table 5

Means and Standard Deviations of Selected Measures
for Cohort Students Between Sixth and Eighth Grades

All

Variable	Cases	Mean	Std dev
NSLC6	45	16.8667	3.9289
STRAP7	72	3.6615	0.4677
STRFR7	72	1.6436	0.3432
NSLC7	74	14.0135	4.2764
READ67	86	7.9622	1.6803
MATH67	84	7.0571	1.7833
STRAP8	90	3.6653	0.3994
STRFR8	90	1.6521	0.3173
DIST8	90	29.9800	8.3377
NGPA8	90	69.9556	10.6549

Males

Variable	Cases	Mean	Std dev
NSLC6	25	16.7600	4.4467
STRAP7	41	3.4655	0.4972
STRFR7	41	1.6143	0.3196
NSLC7	40	13.9500	3.6511
READ67	50	8.1230	1.7009
MATH67	49	6.9714	1.6262
STRAP8	53	3.5377	0.3664
STRFR8	53	1.6761	0.3159
DIST8	53	28.5849	7.8113
NGPA8	53	67.2264	10.4378

Females

Variable	Cases	Mean	Std dev
NSLC6	20	17.0000	3.2767
STRAP7	31	3.9194	0.4193
STRFR7	31	1.6754	0.3748
NSLC7	34	14.0882	4.9688
READ67	36	7.7389	1.6489
MATH67	35	7.1786	2.0010
STRAP8	37	3.8480	0.3772
STRFR8	37	1.6149	0.3199
DIST8	37	29.5676	9.1187
NGPA8	37	73.8649	9.8296

Table 6

Correlations of Selected Measures for Cohort Students Between Sixth and Eighth Grades

All

	MSLC6	STRAP7	STPR7	MSLC7	READ67	MATW67	STRAP8	STPR8	DIST8	MGPA8
MSLC6	1.0000 (45) P=0.000	-0.2711 (42) P= .041	0.1689 (42) P= .142	0.2994 (42) P= .027	-0.3702 (44) P= .006	-0.2440 (43) P= .057	0.0998 (45) P= .257	0.0423 (45) P= .391	0.0612 (45) P= .345	-0.2927 (45) P= .030
STRAP7	-0.2711 (42) P= .041	1.0000 (72) P=0.000	-0.1082 (71) P= .185	-0.1021 (66) P= .207	0.0476 (71) P= .347	0.1499 (69) P= .109	0.5617 (72) P=0.000	-0.1209 (72) P= .156	-0.1478 (72) P= .108	0.2887 (72) P= .007
STPR7	0.1689 (42) P= .142	-0.1082 (71) P= .185	1.0000 (72) P=0.000	0.4483 (65) P=0.000	-0.2338 (71) P= .025	-0.3082 (69) P= .005	-0.1269 (72) P= .144	0.6094 (72) P=0.000	0.4107 (72) P=0.000	-0.1449 (72) P= .112
MSLC7	0.2994 (42) P= .027	-0.1021 (66) P= .207	0.4483 (65) P=0.000	1.0000 (74) P=0.000	-0.2440 (74) P= .018	-0.3359 (73) P= .002	-0.0990 (74) P= .470	0.5043 (74) P=0.000	0.2000 (74) P= .044	-0.3255 (74) P= .002
READ67	-0.3702 (44) P= .006	0.0476 (71) P= .347	-0.2338 (71) P= .025	-0.2440 (74) P= .018	1.0000 (86) P=0.000	0.4533 (84) P=0.000	0.0993 (86) P= .181	-0.1612 (86) P= .069	-0.0694 (86) P= .263	0.3720 (86) P=0.000
MATW67	-0.2440 (43) P= .057	0.1499 (69) P= .109	-0.3082 (69) P= .005	-0.3359 (73) P= .002	0.4533 (84) P=0.000	1.0000 (84) P=0.000	0.1869 (84) P= .044	-0.2710 (84) P= .006	-0.1809 (84) P= .072	0.6471 (84) P=0.000
STRAP8	0.0998 (45) P= .257	0.5617 (72) P=0.000	-0.1269 (72) P= .144	-0.0990 (74) P= .470	0.0993 (86) P= .181	0.1869 (84) P= .044	1.0000 (90) P=0.000	-0.1812 (90) P= .044	-0.0549 (90) P= .304	0.2626 (90) P= .006
STPR8	0.0423 (45) P= .391	-0.1209 (72) P= .156	0.6094 (72) P=0.000	0.5043 (74) P=0.000	-0.1612 (86) P= .069	-0.2710 (84) P= .006	-0.1812 (90) P= .044	1.0000 (90) P=0.000	0.4325 (90) P=0.000	-0.2493 (90) P= .009
DIST8	0.0612 (45) P= .345	-0.1478 (72) P= .108	0.4107 (72) P=0.000	0.2000 (74) P= .044	-0.0694 (86) P= .263	-0.1809 (84) P= .072	-0.0549 (90) P= .304	0.4325 (90) P=0.000	1.0000 (90) P=0.000	-0.0359 (90) P= .368
MGPA8	-0.2927 (45) P= .030	0.2887 (72) P= .007	-0.1449 (72) P= .112	-0.3255 (74) P= .002	0.3720 (86) P=0.000	0.6471 (84) P=0.000	0.2626 (90) P= .006	-0.2493 (90) P= .009	-0.0359 (90) P= .368	1.0000 (90) P=0.000

Table 7

Correlations of Selected Measures
for Male Cohort Students Between Sixth and Eighth Grades

	WSLC6	STRAP7	STWP87	WSLC7	READ67	MATH67	STRAP8	STWPB8	DIST8	WCPA8
WSLC6	1.0000 (25) P=.0000	-0.4928 (23) P= .008	-0.0042 (23) P= .492	0.1547 (22) P= .246	-0.2827 (24) P= .090	-0.2580 (23) P= .117	-0.0474 (25) P= .411	0.0172 (25) P= .467	0.2381 (25) P= .126	-0.3291 (25) P= .054
STRAP7	-0.4928 (23) P= .008	1.0000 (41) P=.0000	-0.2852 (40) P= .037	-0.1141 (36) P= .254	0.2926 (41) P= .032	0.3233 (40) P= .021	0.4160 (41) P= .003	-0.1165 (41) P= .234	-0.3226 (41) P= .020	0.2844 (41) P= .036
STWP87	-0.0042 (23) P= .492	-0.2852 (40) P= .037	1.0000 (41) P=.0000	0.3114 (35) P= .034	-0.0217 (41) P= .447	-0.2331 (40) P= .074	-0.2160 (41) P= .087	0.5724 (41) P=0.000	0.3528 (41) P= .012	-0.1329 (41) P= .204
WSLC7	0.1547 (22) P= .246	-0.1141 (36) P= .254	0.3114 (35) P= .034	1.0000 (40) P=.0000	-0.1239 (40) P= .223	-0.2532 (40) P= .057	-0.1265 (40) P= .218	0.3840 (40) P= .007	0.1520 (40) P= .174	-0.2730 (40) P= .044
READ67	-0.2827 (24) P= .090	0.2926 (41) P= .032	-0.0217 (41) P= .447	-0.1239 (40) P= .223	1.0000 (50) P=.0000	0.3005 (49) P= .018	0.2834 (50) P= .023	-0.0939 (50) P= .258	-0.0715 (50) P= .311	0.3521 (50) P= .006
MATH67	-0.2580 (23) P= .117	0.3233 (40) P= .021	-0.2331 (40) P= .074	-0.2532 (40) P= .057	0.3005 (49) P= .018	1.0000 (49) P=.0000	0.2110 (49) P= .073	-0.2070 (49) P= .077	-0.1996 (49) P= .085	0.6162 (49) P=0.000
STRAP8	-0.0474 (25) P= .411	0.4160 (41) P= .003	-0.2160 (41) P= .087	-0.1265 (40) P= .218	0.2834 (50) P= .023	0.2110 (49) P= .073	1.0000 (53) P=.0000	-0.1422 (53) P= .155	-0.0431 (53) P= .380	0.2533 (53) P= .034
STWPB8	0.0172 (25) P= .467	-0.1165 (41) P= .234	0.5724 (41) P=0.000	0.3840 (40) P= .007	-0.0939 (50) P= .258	-0.2070 (49) P= .077	-0.1422 (53) P= .155	1.0000 (53) P=.0000	0.2570 (53) P= .032	-0.2563 (53) P= .032
DIST8	0.2381 (25) P= .126	-0.3226 (41) P= .020	0.3528 (41) P= .012	0.1520 (40) P= .174	-0.0715 (50) P= .311	-0.1996 (49) P= .085	-0.0431 (53) P= .380	0.2570 (53) P= .032	1.0000 (53) P=.0000	-0.1849 (53) P= .092
WCPA8	-0.3291 (25) P= .054	0.2844 (41) P= .036	-0.1329 (41) P= .204	-0.2730 (40) P= .044	0.3521 (50) P= .006	0.6162 (49) P=0.000	0.2533 (53) P= .034	-0.2563 (53) P= .032	-0.1849 (53) P= .092	1.0000 (53) P=.0000

Table 8

Correlations of Selected Measures
for Female Cohort Students Between Sixth and Eighth Grades

	VSLC6	STRAP7	STPF97	VSLC7	READ67	MATH67	STRAP8	STRPR8	DIST8	NCPA8
VSLC6	1.0000 (20) P=0.000	-0.1822 (19) P= .228	0.3706 (19) P= .059	0.4911 (20) P= .014	-0.5127 (20) P= .000	-0.2317 (20) P= .163	0.2554 (20) P= .139	0.1249 (20) P= .300	-0.3511 (20) P= .065	-0.2337 (20) P= .161
STRAP7	-0.1822 (19) P= .228	1.0000 (31) P=0.000	-0.0570 (31) P= .380	-0.0412 (30) P= .335	-0.0838 (30) P= .330	-0.0434 (29) P= .412	0.5236 (31) P= .001	-0.0470 (31) P= .401	0.0546 (31) P= .381	0.0983 (31) P= .299
STPF97	0.3706 (19) P= .059	-0.0570 (31) P= .380	1.0000 (31) P=0.000	0.5529 (30) P= .001	-0.4660 (30) P= .005	-0.3865 (29) P= .019	-0.1243 (31) P= .253	0.4725 (31) P=0.000	0.4029 (31) P= .003	-0.2197 (31) P= .118
VSLC7	0.4911 (20) P= .014	-0.0412 (30) P= .335	0.5529 (30) P= .001	1.0000 (34) P=0.000	-0.3450 (34) P= .023	-0.4004 (33) P= .010	0.0632 (34) P= .361	0.6461 (34) P=0.000	0.2459 (34) P= .080	-0.4196 (34) P= .005
READ67	-0.5127 (20) P= .000	-0.0838 (30) P= .330	-0.4660 (30) P= .005	-0.3450 (34) P= .023	1.0000 (36) P=0.000	0.6612 (35) P=0.000	-0.0254 (36) P= .442	-0.2829 (36) P= .047	-0.0529 (36) P= .380	0.5963 (36) P=0.000
MATH67	-0.2317 (20) P= .163	-0.0434 (29) P= .412	-0.3865 (29) P= .019	-0.4004 (33) P= .010	0.6612 (35) P=0.000	1.0000 (35) P=0.000	0.1440 (35) P= .205	-0.3375 (35) P= .024	-0.1329 (35) P= .223	0.7000 (35) P=0.000
STRAP8	0.2554 (20) P= .139	0.5236 (31) P= .001	-0.1243 (31) P= .253	0.0632 (34) P= .361	-0.0254 (36) P= .442	0.1440 (35) P= .205	1.0000 (37) P=0.000	-0.1758 (37) P= .150	-0.1332 (37) P= .216	0.0318 (37) P= .426
STRPR8	0.1249 (20) P= .300	-0.0470 (31) P= .401	0.6725 (31) P=0.000	0.6461 (34) P=0.000	-0.2829 (36) P= .047	-0.3375 (35) P= .024	-0.1758 (37) P= .150	1.0000 (37) P=0.000	0.6687 (37) P=0.000	-0.1937 (37) P= .125
DIST8	-0.3511 (20) P= .065	0.0546 (31) P= .381	0.4029 (31) P= .003	0.2459 (34) P= .080	-0.0529 (36) P= .380	-0.1329 (35) P= .223	-0.1332 (37) P= .216	0.6687 (37) P=0.000	1.0000 (37) P=0.000	0.1109 (37) P= .257
NCPA8	-0.2337 (20) P= .161	0.0983 (31) P= .299	-0.2197 (31) P= .118	-0.4196 (34) P= .005	0.5963 (36) P=0.000	0.7000 (35) P=0.000	0.0318 (37) P= .426	-0.1937 (37) P= .125	0.1109 (37) P= .257	1.0000 (37) P=0.000

Table 9

Means, Standard Deviations, and Correlations of
Regression Analysis Variables Including Reading Test Score

	MEAN	STD DEV
MGPA8	71.838	9.669
READ67	7.991	1.629
NSLC7	14.014	4.276
STRA8PR	3.716	0.457
STRF8PR	1.421	0.358
STF8LCX	20.554	10.362

N OF CASES = 74

CORRELATION

	MGPA8	READ67	NSLC7	STRA8PR	STRF8PR	STF8LCA
MGPA8	1.000	0.364	-0.325	0.303	-0.452	-0.411
READ67	0.364	1.000	-0.244	0.063	-0.274	-0.301
NSLC7	-0.325	-0.244	1.000	-0.012	0.421	0.840
STRA8PR	0.303	0.063	-0.012	1.000	-0.277	-0.160
STRF8PR	-0.452	-0.274	0.421	-0.277	1.000	0.818
STF8LCX	-0.411	-0.301	0.840	-0.160	0.818	1.000

Table 10

Means, Standard Deviations, and Correlations of
Regression Analysis Variables Including Mathematics Test Score

	MEAN	STD DEV
MGPA8	71.479	9.658
MATH67	7.149	1.860
NSLC7	13.959	4.280
STRA8PR	3.715	0.460
STRF8PR	1.421	0.361
STF8LCX	20.474	10.417

N OF CASES = 73

CORRELATION

	MGPA8	MATH67	NSLC7	STRA8PR	STRF8PR	STF8LCA
MGPA8	1.000	0.677	-0.316	0.309	-0.456	-0.408
MATH67	0.677	1.000	-0.336	0.174	-0.381	-0.386
NSLC7	-0.316	-0.336	1.000	-0.015	0.424	0.840
STRA8PR	0.309	0.174	-0.015	1.000	-0.277	-0.162
STRF8PR	-0.456	-0.381	0.424	-0.277	1.000	0.820
STF8LCX	-0.408	-0.386	0.840	-0.162	0.820	1.000

Table 11

Multiple Regression of Eighth Grade Midyear GPA on Reading, Locus of Control, Stressor Appraisal, and Stressor Frequency for All Cohort Students

Step	Multr	Rsq	Adjrsq	F(equ)	Sigf	Rsqch	Fch	Sigch		Variable	Betain	Correl
1	0.3639	0.1324	0.1204	10.990	.001	0.1324	10.990	.001	IN:	READ67	0.3639	0.3639
2	0.4382	0.1920	0.1692	8.435	.001	0.0596	5.213	.025	IN:	MSLC7	-0.2514	-0.3256
3	0.5205	0.2710	0.2397	8.674	0.000	0.0790	7.584	.007	IN:	STRAPR	0.2818	0.3697
4	0.5664	0.3209	0.2814	8.147	0.000	0.0498	5.069	.028	IN:	STRFRPR	-0.2425	-0.4522
5	0.6065	0.3679	0.3213	7.912	0.000	0.0470	5.056	.028	IN:	STRRACE	1.2047	-0.4113

Table 12

Multiple Regression of Eighth Grade Midyear GPA on Reading, Locus of Control, Stressor Appraisal, and Stressor Frequency for Male Cohort Students

Step	Multr	Rsq	Adjrsq	F(equ)	Sigf	Rsqch	Fch	Sigch		Variable	Betain	Correl
1	0.2939	0.0864	0.0673	3.592	.066	0.0864	3.592	.066	IN:	READ67	0.2939	0.2939
2	0.3784	0.1432	0.0969	3.092	.057	0.0568	2.455	.126	IN:	MSLC7	-0.2403	-0.2730
3	0.4352	0.1894	0.1219	2.804	.054	0.0462	2.052	.161	IN:	STRAPR	0.2767	0.3200
4	0.5519	0.3015	0.2251	3.832	.011	0.1151	5.793	.021	IN:	STRFRPR	-0.3855	-0.5021
5	0.5671	0.3216	0.2219	3.224	.017	0.0171	0.856	.361	IN:	STRRACE	0.7507	-0.4551

Table 13

Multiple Regression of Eighth Grade Midyear GPA on Reading, Locus of Control, Stressor Appraisal, and Stressor Frequency for Female Cohort Students

Step	Multr	Rsq	Adjrsq	F(equ)	Sigf	Rsqch	Fch	Sigch		Variable	Betain	Correl
1	0.6296	0.3964	0.3775	21.012	0.000	0.3964	21.012	0.000	IN:	READ67	0.6296	0.6296
2	0.6727	0.4525	0.4172	12.811	0.000	0.0561	3.179	.084	IN:	MSLC7	-0.2574	-0.4196
3	0.6744	0.4549	0.4003	8.341	0.000	0.0023	0.125	.726	IN:	STRAPR	0.0481	0.0171
4	0.6747	0.4552	0.3901	6.059	.001	0.0005	0.024	.877	IN:	STRFRPR	-0.0265	-0.1141
5	0.6912	0.4777	0.3945	5.122	.002	0.0225	1.205	.282	IN:	STRRACE	0.4980	-0.1819

Table 14

Multiple Regression of Eighth Grade Midyear GPA on Mathematics, Locus of Control, Stressor Appraisal, and Stressor Frequency for All Cohort Students

Step	Multr	Rsq	Adjrsq	F(equ)	Sigf	Rsqch	Fch	Sigch		Variable	Betain	Correl
1	0.6766	0.4578	0.4501	59.943	.000	0.4578	59.943	.000	IN:	MATH67	0.6766	0.6766
2	0.6831	0.4667	0.4514	30.624	.000	0.0089	1.165	.284	IN:	MSLC7	-0.1000	-0.3160
3	0.7115	0.5063	0.4848	23.587	0.000	0.0396	5.540	.021	IN:	STRAGPR	0.2024	0.3091
4	0.7265	0.5277	0.5000	18.998	0.000	0.0215	3.089	.083	IN:	STRFGPR	-0.1746	-0.4557
5	0.7362	0.5419	0.5077	15.853	0.000	0.0142	2.074	.155	IN:	STFAGCA	0.0738	-0.4080

Table 15

Multiple Regression of Eighth Grade Midyear GPA on Mathematics, Locus of Control, Stressor Appraisal, and Stressor Frequency for Male Cohort Students

Step	Multr	Rsq	Adjrsq	F(equ)	Sigf	Rsqch	Fch	Sigch		Variable	Betain	Correl
1	0.6672	0.4451	0.4305	30.486	0.000	0.4451	30.486	0.000	IN:	MATH67	0.6672	0.6672
2	0.6758	0.4567	0.4273	15.552	0.000	0.0116	0.787	.381	IN:	MSLC7	-0.1112	-0.2730
3	0.6923	0.4792	0.4359	11.044	0.000	0.0225	1.558	.220	IN:	STRAGPR	0.1558	0.3200
4	0.7284	0.5305	0.4769	9.888	0.000	0.0513	3.622	.059	IN:	STRFGPR	-0.2581	-0.5021
5	0.7284	0.5306	0.4616	7.688	0.000	0.0001	0.009	.927	IN:	STFAGCA	-0.0050	-0.4551

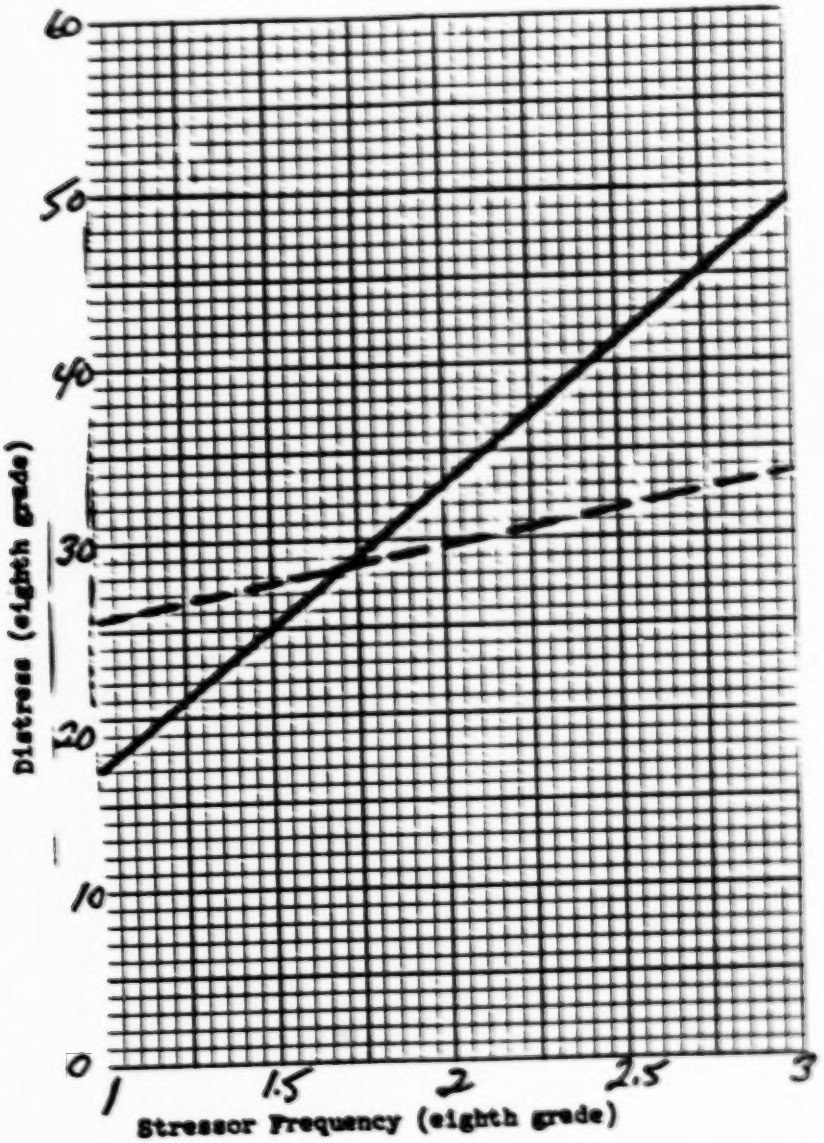
Table 16

Multiple Regression of Eighth Grade Midyear GPA on Mathematics, Locus of Control, Stressor Appraisal, and Stressor Frequency for Female Cohort Students

Step	Multr	Rsq	Adjrsq	F(equ)	Sigf	Rsqch	Fch	Sigch		Variable	Betain	Correl
1	0.7791	0.6079	0.5952	48.061	0.000	0.6079	48.061	0.000	IN:	MATH67	0.7791	0.7791
2	0.7887	0.6221	0.5964	24.648	0.000	0.0142	1.128	.291	IN:	MSLC7	-0.1301	-0.4214
3	0.7913	0.6263	0.5877	16.203	0.000	0.0042	0.328	.571	IN:	STRAGPR	-0.0665	0.0054
4	0.7924	0.6279	0.5747	11.810	0.000	0.0015	0.114	.738	IN:	STRFGPR	0.0490	-0.3160
5	0.8019	0.6430	0.5769	9.749	0.000	0.0152	1.196	.298	IN:	STFAGCA	0.1265	-0.3798

Figure 1

Regression of Distress on Stressor Frequency
for Students with High and Low Nowicki-Strickland Scores



——— = Nowicki-Strickland Externality > 14 (n=34)

r = .63 (p .001)

---------- = Nowicki-Strickland Externality ≤ 14 (n=40)

r = .11 (n. s.)